Moreover, homes passed by cable equals 97 percent of U.S. television-owning households.[12] Data on cable subscribership in the U.S. as compared to California is shown in Table II-3. The number of subscribers to some of the large cable systems in California is shown in Table II-4.

TABLE II-3
COMPARISON OF THE CABLE INDUSTRY IN CALIFORNIA AND THE U.S.

	Cable Systems	Homes Passed	Basic Cable Subscribers	Miles of Plant
California	382	10,307,944	6,300,660	88,559
U.S.	11,216	85,415,595	56,375,698	1,168,808

Source: NCTA, *Cable Television Developments* (1995).

percent. NCTA, CABLE TELEVISION DEVELOPMENTS (Spring 1995).

12. *See* NCTA, THE CABLE TELEVISION HANDBOOK 5 (Jan. 1995; rev. Apr. 1995).

TABLE II-4
NUMBER OF SUBSCRIBERS TO SOME LARGE CABLE SYSTEMS IN CALIFORNIA

Rank in U.S. (by No. of Subscribers)	System Location	Operator	Basic Subscribers	Date
7	San Diego	Cox	326,525	10/94
9	Los Angeles	Continental	279,672	1/95
16	Sacramento	Scripps Howard	213,700	10/94
39	San Jose	TCI	164,000	12/94
41	San Francisco	Viacom	160,600	10/94
46	San Diego	Time Warner	154,127	12/94
50	Los Angeles suburbs	Charter	150,068	12/94
Total of Top 50 in U.S.			11,865,005	

Source: NCTA, *Cable Television Developments* (1995).

The largest telecommunications and media companies have cable properties and an interest in applying them to telecommunications. For example, Cablevision, with one million subscribers, plans to complete tests in 1995 and to offer service in 1996, in what the *New York Times* calls "the nation's first head-to-head battle for telephone customers between a telephone giant and a major cable television provider."[13] The alliance between the cable television distributor Time Warner and the regional Bell US West is currently conducting a trial of its cable telephony system in Rochester, NY and will offer residential phone service by the beginning of 1996; Time Warner is also negotiating with NYNEX to serve the New York market and carrying out entry in Ohio.[14]

In California, competition between cable companies and other telecommunications providers is in progress. For example, the largest multimedia company, Time Warner, has applied to provide local service in California.[15] It is reported that "Viacom, Inc. is currently upgrading its Castro Valley, CA system to 'full impulse, two way active' capabilities. This will allow Viacom to offer a variety of video-on-demand and interactive programming services. The system will use fiber-to-the-feeder technology, and will allow for the testing of

13. Peter Marks, *NYNEX Lets Rival Sell Phone Service*, NEW YORK TIMES C12 (Feb. 17, 1995).

14. Jon Pessah, *Breaking the Sound Barrier: Time Warner Prepares to Break into the Phone Business as the Walls Between Cable and Phone Companies Come Tumbling Down*, NEWSDAY C1 (Mar. 6, 1995). In Oct. 1994, the cable company requested permission from the Public Utilities Commission of Ohio to offer local exchange service in 37 counties, to include Cincinnati and Columbus. Mike Boyer, *Phone Home Via Cable: Time Warner Laying Lines in Effort to End Monopoly*, CINCINNATI ENQUIRER D1 (Nov. 21, 1994). According to THE WALL STREET JOURNAL (Mar. 20, 1995), "All these forces are converging in Rochester, where Time Warner has reached an agreement with the local phone company and New York state regulators that allows it to begin offering phone service. Time Warner began selling cellular phone service there last fall, and plans to offer traditional phone service to its customers later this year."

15. *Id.* Pessah at C1.

innovative telecommunications services such as personal communications services."[16] Continental Cablevision, Inc., said it had asked the PUC for authority to offer telephony in 10 counties: "If the petition is approved, Continental will invest at least $700 million in the state, converting its existing cable TV systems into broad band telecommunications networks capable of providing switched voice, video, and data services."[17]

The revenues from the provision of cable services are sufficient to cover entry costs with even a small market share for new entrants.[18] Other cable companies planning an entry into the local exchange market include Century Telecommunications, Inc., NewTelco, L.P. (owned by TCG who, in turn, is owned by TCI, Cox Communication, Continental Cablevision and Comcast), and Continental Telecommunications of California (a subsidiary of Continental Cablevision).[19]

2. *Fiber Optics and Competitive Access Providers*

The fiber optic technology employed by competitive access providers (CAPs), such as Teleport Communications and Metropolitan Fiber Systems, provides transmission service and access to interexchange carriers. Surveys suggest that a large proportion of larger business customers rely on CAPs for at least part of their access services.[20] It is reported that only about half of all virtual private network customers opt for access through their local telephone company rather than using dedicated links to the interexchange carrier than are alternately supplied.[21]

Fiber rings allow a new entrant to achieve a high volume of transmission capacity at lower unit cost, as compared to the traditional copper-based telephone system.[22] Indeed, it is far from surprising that CAPs have begun by serving the most profitable high volume customers, since entry in many industries often occurs in this manner. Economic analysis suggests that, faced with a number of alternatives, an entrant would have an incentive to begin with the segment of the market that would yield the highest return.[23] For example, MCI's entry into local service through its subsidiary MCI Metro will begin with the business market and then focus on the residential market.[24] Having established transmission facilities, the CAPs have the capacity to expand their service to other market segments. Thus, MCI plans to offer a full range of local telephone services to business customers in New York City, and also plans local service in Atlanta, Baltimore, Boston, Chicago, Dallas, Detroit, Hartford,

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16. *See supra* note 12 at 34.

17. TELECOMMUNICATIONS REPORTS (Sept. 4, 1995).

18. According to Eben Shapiro, THE WALL STREET JOURNAL (Mar. 20, 1995) "Given the sheer size of the phone market, analysts say, cable companies will need to sign up only about 15 percent of homes within range of cable wires to make a profit. Time Warner says it can break even if only 5 percent sign up."

19. *See* D.95-07-054, CPUC CPCN filings to provide local exchange services in 1996.

20. Pacific Telesis ex parte, Nos. 91-141 and 91-213 (F.C.C. Apr. 29, 1992). J. KRAEMER (DELOITTE & TOUCHE), COMPETITIVE ASSESSMENT OF THE MARKET FOR ALTERNATIVE LOCAL TRANSPORT (1991). Deloitte & Touche estimates that, in the absence of significant competitive response by the telco, a CAP "can be expected to achieve a 40 to 50 percent share of the DS-1 and DS-3 markets in [its] geographical service area."

21. This is according to a survey by the Yankee Group. *See* Ellis Booher, *Virtual Network Equals Savings*, COMPUTERWORLD 51 (Mar. 5, 1990).

22. According to the FEDERAL COMMUNICATIONS COMMISSION (FCC), FIBER DEPLOYMENT UPDATE (May 1994), "[a]n operation in a single city typically involves a $2 million to $10 million investment and serves at least 20 buildings." Moreover, the FCC observes that "[m]any carriers are acutely aware that although up-front costs for fiber deployment in absolute terms are high, a significant portion of the total investment can be deferred until actual demand materializes, thus allowing the use of the most up-to-date equipment available for equipping the fiber. Sprint's recent announcement (Press Release on SONET upgrade dated Mar. 14, 1994) that it was upgrading its fiber capacity without deploying additional fiber is a good example of this."

23. "The key targets of the urban systems are large downtown office buildings in cities where the deployment cost and regulatory constraints of new fiber systems are not excessive. Typically a cable several miles in length containing 20 to 200 fibers is deployed in existing conduit or in subway tunnels in a ring structure. The ends of the fiber cable are connected at a hub location. At least one fiber pair in the ring is typically dedicated to a single office building and capacity is often electronically subdivided for customer access within the building. Some carriers are serving more than one customer with each fiber pair, while others have dedicated one or more fiber pairs for a single customer, which is often an interexchange carrier. In either case, the fiber rings afford a simple inherent route redundancy arrangement since traffic can reach the hub in either direction around the loop." *Id.*

24. *MCI Widens Local Effort*, NEW YORK TIMES C5 (Dec. 12, 1994).

Houston, Los Angeles and Miami.[25] Moreover, the companies that are currently providing access (including CAPs) and intraLATA toll service are poised to expand their services.

The CAPs need not recreate the entire network to increase substantially their share of earnings in the local exchange market. They can serve major business customers in high density business districts of large cities. Teleport Communications Group, which will become part of Sprint Corp.'s joint venture with three cable TV systems, plans to seek authority to compete with Pacific Bell and GTE California throughout the state. It has already invested millions of dollars in local fiber optic networks and switching facilities in the San Francisco Bay, Los Angeles, and San Diego areas. Its San Francisco Bay Area network extends for 337-route miles, allowing Teleport to serve Oakland and San Jose.[26] Some of the California CAPs and their parent companies are reported in Tables II-5 and II-6.

The NATA finds that "[a]t least 10 CAPs hold PUC certificates authorizing them to provide local intra-LATA high-speed digital private line and special access services at the T-1 rate and above."[27] To show the rapid growth of CAPs, some of the California CAPs' fiber miles deployed in the U.S. as a whole are exhibited in Table II-7.

25. Edmund L. Andrews, *MCI Will Compete in Local Phone Services*, NEW YORK TIMES D1 (Mar. 6, 1995).
26. TELECOMMUNICATIONS REPORTS (Sept. 4, 1995).
27. NATA, 1995 TELECOMMUNICATIONS MARKET REVIEW AND FORECAST 32 (1995).

TABLE II-5
SOME OF THE CALIFORNIA COMPETITIVE ACCESS PROVIDERS

CAP	Existing Network	Planned Networks
MFS	San Francisco, Los Angeles, San Jose	West Los Angeles, San Fernando Valley, Glendale
Teleport	San Francisco, Oakland, Los Angeles, San Diego, San Jose	Culver City, West Los Angeles, Century City, Burbank, Beverly Hills
Bay Area Teleport	San Francisco, Oakland, Sunnyvale, Fremont, Santa Rosa, Lodi	
Brooks Fiber Communications	Sacramento, West Sacramento	San Jose, Sunnyvale, Santa Clara
Linkatel		San Diego
Digital Direct	Sacramento	
Electric Lightwave	Sacramento, Folsom	Los Angeles, San Diego

Source: Peter W. Huber, *Competition and Open Access in the Telecommunications Markets of California* (February 8, 1994); and FCC, *Fiber Deployment Update - End of Year 1994* (July 1995).

TABLE II-6
PARENT COMPANIES FOR SOME OF THE CALIFORNIA CAPS

CAP	Parent Company	1993 Parent Company Revenues ($ Billions)
MFS	Peter Kiewit Sons	2.02[1]
Teleport	Cox (30%)	2.67
	TCI (30%)	4.15
	Comcast Corp. (20%)	1.34
	Continental Cablevision (20%)	1.18
Bay Area Teleport	IntelCom	0.02
Brooks Fiber Communications		n/a
Linkatel	Cox	2.67
Digital Direct	TCI	4.15
Electric Lightwave	Citizens Utilities	0.62

Note:
[1] Revenue for Peter Kiewit Sons is from 1992.
Source: Peter W. Huber, *Competition and Open Access in the Telecommunications Markets of California* (February 8, 1994); *Hoover's Master List of Major U.S. Companies, 1994-1995* (The Reference Press, 1995); *Hoover's Handbook of American Business, 1995* (The Reference Press, 1995); and FCC, *Fiber Deployment Update - End of Year 1994* (July 1995).

TABLE II-7
FIBER MILES DEPLOYED IN THE U.S. OF CAPS OPERATING IN CALIFORNIA

CAP	1987	1988	1989	1990	1991	1992	1993	1994
MFS	3,059	5,861	13,374	17,219	29,338	40,801	65,572	105,483
Teleport	4,711	5,433	13,030	18,531	24,729	39,998	96,060	167,314
IntelCom[1]					4,800	6,500	8,580	19,049
Phoenix Fiberlink[2]				2,631	3,823	4,252	6,188	18,024
Digital Direct					7,144	7,898	5,361	29,279
Electric Lightwave					451	6,820	11,686	20,469
Total	7,770	11,294	26,404	38,381	70,285	106,269	193,447	359,618

Notes:
[1] IntelCom Group includes Bay Area Teleport.
[2] Phoenix Fiberlink includes Brooks Fiber.
Source: FCC, *Fiber Deployment Update - End of Year 1994* (July 1995), Table 14.

In addition to their own facilities, 72 CAPs have collocation orders that have been received by Pacific Bell. Pacific Bell reports further that these collocators are all in greater Los Angeles, San Francisco Bay, San Diego, and Sacramento. While these centers are only 7.5 percent of Pacific Bell's wire centers, they represent 25 percent of Pacific Bell's access lines, 35 percent of business revenues, 40 percent of transport revenues, 61.5 percent of access traffic, 56.5 percent of DS1 traffic, and 75 percent of DS3 traffic. In addition, 16 of Pacific Bell's top offices already have collocation. These offices contain about 50 percent of access traffic.[28]

The ability of CAPs to provide local telephone service on a facilities-basis or by reselling is real. Several CAPs recently filed applications with the CPUC to provide local telephone service. Many of these firms plan to provide numerous telecommunications services on a facilities-basis in their current operating region, and on a resale basis for the rest of California. The examples are numerous. Brooks Fiber Communication, based in St. Louis, plans to provide services such as dial tone access, PBX trunks, Centrex, directory access, and operator service in San Jose and Sacramento. The firm plans to extend service to the Central Valley. MFS plans to provide local services to businesses in areas coincident with existing facilities in San Francisco, San Jose, Los Angeles, Orange County, and San Diego. MFS plans to offer such services as basic dial tone, PBX and DID trunks, and Centrex lines. In addition, they plan to offer direct dial calling, operator assisted calling, directory assistance, frame relay, and 911 service at no charge. Finally, Electric Lightwave of Vancouver, Washington plans to enter the California market by reselling, first in Sacramento, then in Redding, Stockton, and San Diego.[29]

3. *Wireless Communications*

Wireless cellular technology is a viable alternative to traditional wireline service. Cellular telephones can be used for local calls and access to local exchange and interexchange carriers. Cellular service is easily obtained, and it is employed regularly by many individuals. The market for wireless communications is growing rapidly. There were about one million cellular subscribers in 1987.[30] By the end of 1994, there were over 25 million subscribers,

28. Pacific Bell.
29. *See* D.95-07-054, CPUC CPCN filings to provide local exchange services in 1996.
30. NATA, 1995 TELECOMMUNICATIONS MARKET REVIEW AND FORECAST 142 (1995).

with over 17,000 new customers reported to be subscribing each day.[31] The payments for access to cellular technology and facilities by AT&T and other companies indicates the market value of these enterprises. For example, AT&T paid $12.6 billion in stock for McCaw Cellular.[32] Such a payment indicates that AT&T finds that there is a market value to cellular communication. This means that for some applications cellular communication is more cost effective or provides greater net benefits than the traditional wireline network. Cellular provides local exchange transmission, access to IXCs, as well as mobile capabilities. The size of the cellular market and the continuing rapid growth in the number of cellular subscribers suggest the importance of the wireless alternative.

Cellular communications, together with the resale of local service, gives a cellular provider the ability to be both a facilities-based and a resale-based local service competitor. At least four cellular companies have filed applications with the CPUC to provide facilities-based and resale local telephone service. Based on their filings, those firms are prepared to offer facilities-based service in their current operating regions and to provide service to the rest of California on a resale-basis. For example, Mammoth Cellular Corporation is owned by Western Wireless Corporation and currently operates in the Los Angeles and Fresno regions (LATAs 4 and 5).[33] It plans to use its existing cellular infrastructure in combination with the resale of local Pacific Bell and GTE service for the rest of California. Additional examples include Cellular 2000, SLO Cellular, Inc., and GTE Mobilnet of California, Inc. GTE Mobilnet has considerable resources and plans to offer service throughout California. Its service will not be limited to basic local service. Its application proposes to offer PBX trunks, intrastate special access, and Centrex.[34]

Telecommunications companies also are investing in digital personal communications services (PCS). PCS, a wireless alternative to traditional cellular service, will soon provide comprehensive communication service. New micro-cellular technology should allow for PCS base stations that are less costly to install than cellular base stations. In addition, these stations are expected to be more energy efficient, and should be able to send signals to many more transmitter stations.[35]

Licensed PCS will provide a wide array of services. Because consumers prefer person-to person calling over location-to-location calling, it has been predicted that PCS will eventually replace standard, wire-based communications for basic telephone service.[36] According to the North American Telecommunications Association, PCS will include "microcellular network, wireless data transport, interactive video data services, specialized mobile radio, mobile satellite service, public paging, personal digital assistants, and personal information communicators. It also may include wireless key and PBX systems, and wireless LANs, for communication both on-site and off-site."[37]

It is forecast that PCS will have over 23 million subscribers by 1997 and 60 million subscribers five years later.[38] PCS is expected to be competitive with wire-based local service and cellular service. PCS services are estimated to cost at least 25 percent less than comparable cellular services because of lower power requirements.[39] As such, analysts estimate that the PCS industry could achieve a 10 percent market penetration

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31. *See Cellular Phone Subscribers Top 19 Million Mark*, REUTERS (Sept. 5, 1994); and COMMUNICATIONS DAILY 3 (Feb. 27, 1995) (year-end 1994 subscribership of 25 million).

32. Andrew Kupfer, *AT&T's $12 Billion Cellular Dream*, FORTUNE 100 (Dec. 12, 1994).

33. Western Wireless Corp. owns more than 70 cellular systems in 17 states and is currently designing and constructing PCS systems in 6 markets.

34. CPCN applications from Mammoth Cellular Corporation, Inc., Cellular 2000, SLO Cellular, Inc., and GTE Mobilnet of California, Inc.

35. *Supra* note 30.

36. *Id.*

37. *Id.*

38. *Telocator Study Says PCS Licensing by 1994 Could Bring 23,300,000 Customers by 1997*, TELECOMMUNICATIONS REPORTS 19 (Jun. 1, 1992). *See also* Amendment of the Commission's Rules to Establish New Personal Communications Services, Notice of Proposed Rulemaking and Tentative Decision, GEN Dkt. No. 90-314, ET Dkt. No. 92-100, 7 F.C.C. Rcd. 5676 ¶ 26 (1992).

39. *Supra* note 30.

within the first three years.[40] Further, a study by US West concluded that the combined cellular, paging, and PCS markets could achieve a 30 percent market penetration by the year 2005.[41]

Current expenditures by companies for spectrum provide evidence that businesses will make the investments required to develop this new wireless digital technology. The first PCS auctions, conducted by the FCC in July of 1994 allocated ten nationwide narrowband licenses which together sold for more than $600 million.[42] In the auctions for regional narrowband licenses beginning on October 26, 1994, 28 companies took part, and prices for the thirty licenses exceeded $490 million.[43]

Over 70 companies entered the FCC's first broadband auction, including AT&T, Pacific Telesis, Ameritech, and Continental Cablevision. Two 30-Mhz blocks of spectrum (denoted as A and B) were auctioned off in each of the 51 MTAs (Major Trading Areas). Some companies formed consortia such as WirelessCo., L.P. (Sprint, Comcast, Cox Communications and Tele-Communications Inc.) and P.C.S. Primeco L.P. (NYNEX, Bell Atlantic, US West, and AirTouch). These companies collectively bid $7.7 billion dollars to purchase 99 of the MTA licenses not already reserved as pioneer's preferences.[44] AT&T's payments totaled nearly $1.7 billion at a cost of $15.73 per person for licenses covering an area with a population of 107 million people.[45] In addition, those companies will spend a great deal more constructing transmission facilities and marketing new PCS services.

In California, both winners of the auctions are serious competitors in the telecommunications industry. Pacific Telesis Mobile Services, a wholly owned subsidiary of Pacific Telesis Group, paid $493,500,000 for frequency Block B in the Los Angeles-San Diego market, and $202,150,000 for Block B in the San Francisco-Oakland-San Jose market. WirelessCo. paid $206,500,000 for Block A in the San Francisco-Oakland-San Jose market. Finally, Cox Communications Wireless, Inc. will acquire Block A in the Los Angeles-San Diego area through a pioneer preference award. Cox is expected to pay $251,918,526 for this market. Together, these competitors paid over $1.1 billion for markets containing over 31 million consumers.[46]

These payments establish that the PCS auction winners anticipate making the irreversible investments and other expenditures that are required to provide PCS service. Clearly, therefore, the costs of setting up PCS service are far from being an impenetrable barrier to entry. In the first broadband auction, there are 99 licenses in 51 Major Trading Areas, so that at least two additional wireless services will be established in each area. There will be additional broadband PCS licenses offered in later auctions.

The establishment and rapid growth of wireless alternatives to the local exchange suggests that any potential entry barriers in telecommunications are increasingly surmountable. The PCS spectrum adds to the spectrum already in use by cellular carriers and specialized mobile radio. In addition, these forms of transmission will compete with satellite transmission of messages and other data. The high level of investment expenditures for spectrum indicate the significant economic value of wireless communications.

4. *Conclusion*

The data on entry into the California local exchange support the hypothesis that multiple technologies are economically viable and many transmission technologies will play an important role in constructing competing

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40. *Id.*
41. *Id.*
42. Edmund L. Andrews, *Airwaves Auction Bring $833 Million for U.S. Treasury*, NEW YORK TIMES A1 (Jul. 30, 1994).
43. Included in the $490.9 million total is a $2 million penalty levied against Pagemart for withdrawing a high bid. Factoring in discounts to designated entities, the government's total earnings from this auction will be roughly $395 million. *See Companies Offer $491 Million; 9 Bidders Win 30 Narrowband PCS Licenses as FCC Auction Closes*, COMMUNICATIONS DAILY 2 (Nov. 9, 1994); and *The Cutting Edge: Computing/ Technology/Innovation; 9 Groups Win Paging Licenses at FCC Auction*, LOS ANGELES TIMES D6 (Nov. 9, 1994).
44. *L.A. Valued Highest; FCC Auction for PCS Licenses Ends With Proceeds Topping $7 Billion*, COMMUNICATIONS DAILY 1 (Mar. 14, 1995).
45. Edmund L. Andrews, *Winners of Wireless Auction to Pay $7 Billion*, NEW YORK TIMES D1 (Mar. 14, 1995).
46. Auctions Division of Wireless Telecommunications Bureau, FCC (Conversations with FCC staff).

networks. As we showed previously, companies entering the local exchange telecommunications market as resellers and facilities-based carriers or both employ a diverse set of transmission technologies. The data on entry further confirm the hypothesis that barriers to entry into California telecommunications markets are far from prohibitive.

C. *Customer Premises Equipment*

It is important to emphasize that technological progress in customer premises equipment competes with local exchange services.

> *Hypothesis 6:* Customers compete the services of the LECs by self-provided customer premises equipment.

The private branch exchange (PBX) and the local area network (LAN) can be substituted for transmission and switching by the telecommunications utility.[47] The use of PBX systems has experienced rapid growth in the mid-1990s. The main systems in use are desktop API, desktop video workstations, wireless PBX stations, and PBX/ACD systems.[48] The private branch exchange (PBX) switching technology allows a reduction in the number of lines required to provide a given level of capacity to a customer's premises, so that the customer can reduce its reliance on the LEC. Moreover, a reduction in the number of lines required to provide a given level of capacity implies that this potential source of sunk costs is reduced for a new entrant into the local telecommunications market. The installed base of U.S. PBX versus Centrex systems is shown in Table II-8. PBX and Centrex lines for California and the U.S. are shown in Table II-9.

47. Note that Shared Tenant Services (STS) are the residential equivalent of the business PBX. STS "provid[es] centralized telecommunications services to tenants in a building or a complex." *See* HARRY NEWTON, NEWTON, TELECOM DICTIONARY 935 (1994).

48. TEQ Consult Group as printed in 1995 TELECOMMUNICATIONS MARKET REVIEW AND FORECAST.

TABLE II-8
U.S. PBX-CENTREX INSTALLED BASE
(1992-1997)

Year	PBX		Centrex	
	Installed Base (thousands of lines)	Market Share (%)	Installed Base (thousands of lines)	Market Share (%)
1992	27,439	76	8,770	24
1993	29,251	77	8,878	23
1994	31,197	77	9,354	23
1995 (proj.)	33,169	77	9,865	23
1996 (proj.)	35,119	77	10,427	23
1997 (proj.)	37,043	77	11,056	23

Source: NATA Research Department.

TABLE II-9
PBX AND CENTREX LINES FOR U.S. AND CALIFORNIA
(IN THOUSANDS, AS OF DECEMBER 31, 1993)

	Analog		Digital			
	(a) PBX Trunks	(b) Centrex Extensions	(c) PBX Trunks	(d) Centrex Extensions	(a + c) Total PBX	(b + d) Total Centrex
California	757,732	1,499,052	14,280	18,484	772,012	1,517,536
U.S.	4,303,359	8,707,124	354,418	1,505,046	4,657,777	10,212,170

Notes:

Analog access lines are shown in 4 Khz equivalents and include access lines from digital switches if the lines themselves are not terminated at the customer's premises as digital lines.

Digital access lines are shown in 64 Kbps equivalents. To be classified as digital, the access lines must be terminated at the customer end as digital lines or be available for use by the customer as digital lines.

Figures include reporting carriers only.

Source: FCC, *Statistics of Communications Common Carriers 1994/1995* (1995).

In 1994, shipments of PBX systems increased approximately 7.5 percent, the fastest growing since 1988, despite competition from Centrex, ISDN, and PC- and LAN-based voice servers."[49] Demand for PBX applications is predicted to increase, particularly as part of computer networks and wireless systems. According to 1995 Telecommunications Market Review and Forecast, "Demand for PBX applications should grow, in both the short and long terms, particularly applications that support configurations with computer systems, LAN interconnections, videoconferencing, and wireless communications." Further, according to the same report "PBXs are slowly but surely becoming all purpose communications controllers, with higher powered system architecture and design, computer-telephone integration (CTI) links, broad band communications and multimedia desktops, and wireless communications."[50]

Not only does the LECs' Centrex service face competition from PBX systems, there will be competitive Centrex providers including MFS, TCG and other CAPs. MFS has purchased Centex, a telemanagement services company, and RealCom, a shared tenant provider, giving MFS an existing base of Centrex and PBX customers in California.[51]

These observations support the hypothesis that customers compete the services of the LECs by employing customer premises equipment.

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49. *Supra* note 30.
50. *Id.*
51. *Supra* note 28, based on *Convergence of Local and Long Distance: The New Integrated Carriers,* YANKEEWATCH 12 (Dec. 1994).

III. THE COMMISSION'S MISPLACED CONCERNS ABOUT THE EMPIRICAL EVIDENCE ON THE ECPR

The Commission tentatively reaches two adverse conclusions concerning the effects of the ECPR. First, the Commission asserts that "use of the ECPR or equivalent methodologies to set prices for interconnection and unbundled network elements would be inconsistent with the section 252(d)(1) requirement that be based on `cost.'"[1] Second, the Commission proposes "that states be precluded from using this methodology to set prices for interconnection and access to unbundled elements."[2] In addition, the Commission solicits comment on whether a state's use of the ECPR "would constitute a barrier to entry as under section 253 of the 1996 Act."[3] Those two adverse conclusions, along with the agency's question signalling its predisposition to reach a third adverse conclusion, are predicated on misplaced concerns about the empirical effects of the ECPR and the Commission's evident lack of knowledge of the state of academic research on the ECPR.

Contrary to the impression that an uninformed reader might receive from the Commission's exiguous discussion of the ECPR, the rule has generated a growing body of academic support. We respond below to the FCC's empirical arguments for opposing the use of the ECPR, as well as to several other familiar canards concerning the rule. Before doing so, however, we briefly review the growing number of academic economists and governmental bodies that endorse the rule.

A. *Academic Proponents of the ECPR*

Other than referencing two writings by William J. Baumol and J. Gregory Sidak, the Commission does not state or imply that any other scholar in law or economics endorses the ECPR. To the contrary, a substantial body of academic literature endorses the ECPR and has refined the rule. In addition to the writings and testimony of Professor Baumol,[4] that literature includes books, articles, and working papers by such distinguished academic economists as Jerry Hausman,[5] Alfred E. Kahn,[6] Paul W. MacAvoy,[7] Janusz A. Ordover,[8] John C. Panzar,[9] and Robert D. Willig.[10] The respected French economists, Jean-Jacques Laffont and Jean Tirole, also endorse the ECPR subject to several caveats that they themselves characterize as academic "quibbles," notwithstanding the

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1. Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, Notice of Proposed Rulemaking, CC Dkt. No. 96-98 ¶ 147 (released Apr. 19, 1996) [hereinafter *NPRM*].

2. *Id.*

3. *Id.*

4. WILLIAM J. BAUMOL & J. GREGORY SIDAK, TOWARD COMPETITION IN LOCAL TELEPHONY (MIT Press & AEI Press 1994); William J. Baumol & J. Gregory Sidak, *The Pricing of Inputs Sold to Competitors*, 11 YALE J. ON REG. 171 (1994); WILLIAM J. BAUMOL & J. GREGORY SIDAK, TRANSMISSION PRICING AND STRANDED COSTS IN THE ELECTRIC POWER INDUSTRY (AEI Press 1995); William J. Baumol & J. Gregory Sidak, *The Pricing of Inputs Sold to Competitors: Rejoinder and Epilogue*, 12 YALE J. ON REG. 177 (1995); William J. Baumol, *Some Subtle Issues in Railroad Deregulation*, 10 INT'L J. TRANS. 341 (1983).

5. Jerry A. Hausman & Timothy J. Tardiff, *Efficient Local Exchange Competition*, 40 ANTITRUST BULL. 529, 539, 544, 552–53 (1995). Hausman and Tardiff propose a pricing rule that is identical to the ECPR, although they distinguish their rule in practice from the benchmark case of the ECPR presented by Baumol and Sidak.

6. Alfred E. Kahn & William Taylor, *The Pricing of Inputs Sold to Competitors: A Comment*, 11 YALE J. ON REG. 225 (1994).

7. PAUL W. MACAVOY, THE FAILURE OF ANTITRUST AND REGULATION TO ESTABLISH COMPETITION IN MARKETS FOR LONG-DISTANCE TELEPHONE SERVICES ch. 6 (MIT Press & AEI Press, forthcoming 1996).

8. Janusz A. Ordover & Robert D. Willig, *Notes on the Efficient Component Pricing Rule*, paper presented at The Transition Towards Competition in Network Industries, First Annual Conference, PURC-IDEI-Cirano, Montreal, October 13-14, 1995.

9. John C. Panzar, *The Economics of Mail Delivery*, *in* GOVERNING THE POSTAL SERVICE 1, 6–10 (J. Gregory Sidak ed., AEI Press 1994); John C. Panzar, *Competition, Efficiency, and the Vertical Structure of Postal Services*, *in* REGULATION AND THE NATURE OF POSTAL DELIVERY SERVICES 91, 96–98 (Michael A. Crew & Paul R. Kleindorfer eds., Kluwer Academic Publishers 1992).

10. Ordover & Willig, *supra* note 8.

Commission's implication in this proceeding and in its earlier proceeding on CMRS interconnection that Professors Laffont and Tirole oppose the ECPR.[11]

B. *Government Proponents of the ECPR*

The ECPR has already advanced from theory to practice in the United States and abroad. The Commission, however, ignores that regulators—including the FCC itself—have already embraced the efficient component-pricing rule, though sometimes while giving a different name to the pricing method employed. The Interstate Commerce Commission has applied the rule in several railroad rate cases involving trackage rights.[12] In 1989 the California Public Utilities Commission (CPUC) embraced the rule in its reform of regulation of local exchange carriers.[13] In 1994 the CPUC reaffirmed its endorsement of the ECPR.[14] In 1992 New Zealand's High Court adopted, and in 1993 its Court of Appeal rejected, the rule (but not its logic) in antitrust litigation between Clear Communications, Ltd., and the former government telephone monopoly, Telecom Corporation of New Zealand, Ltd.[15] In October 1994, however, the Judicial Committee of the Privy Council of the House of Lords reversed in relevant part the decision of the Court of Appeal and, citing academic articles on the ECPR by Professors Baumol and Kahn, held that the rule is compatible with New Zealand antitrust principles governing the pricing of a bottleneck input sold by a vertically integrated firm to its competitors.[16] And in March 1996 the National Regulatory Research Institute—the research arm of the National Association of Regulatory Utility Commissioners (NARUC)—endorsed the use of the ECPR for the pricing of unbundled access to transmission facilities in the electric power industry.[17]

Remarkably, despite its current criticisms of the ECPR, the FCC in effect adopted the rule in March 1996 for the pricing of mandatory leased access of cable television channels:

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11. *NPRM* ¶ 147 (citing Jean-Jacques Laffont & Jean Tirole, *Access Pricing and Competition*, 38 EUR. ECON. REV. 1673 (1994)). Similarly, in its NPRM on CMRS interconnection, the Commission erroneously cited Laffont and Tirole as support for the Commission's following assessment of the ECPR:

> Critics . . . have shown that these properties [of economic efficiency produced by the ECPR] only hold in special circumstances. On the other hand, some express concern that the ECPR may inhibit beneficial entry.

Radio Service Providers; Equal Access and Interconnection Obligations Pertaining to Commercial Mobile Radio Service Providers, Notice of Proposed Rulemaking, Dkts. CC No. 95-185, 94-54, 11 F.C.C. Rcd. ¶ 53 (1996) (citing Laffont & Tirole, *Access Pricing and Competition;* and Jean-Jacques Laffont & Jean Tirole, *Creating Competition Through Interconnection: Theory and Practice,* paper presented at The Transition Towards Competition in Network Industries, First Annual Conference, PURC-IDEI-Cirano, Montreal, October 13-14, 1995 at 3 [hereinafter *CMRS NPRM*]).

12. *See* St. Louis S.W. Ry.—Trackage Rights over Missouri Pac. R.R.—Kansas City to St. Louis, 1 I.C.C.2d 776 (1984), 4 I.C.C.2d 668 (1987), 5 I.C.C.2d 525 (1989), 8 I.C.C.2d 80 (1991).

13. Alternative Regulatory Framework for Local Exchange Carriers, Invest. No. 87-11-033, 33 C.P.U.C.2d 43, 107 P.U.R.4th 1 (1989).

14. Alternative Regulatory Framework for Local Exchange Carriers, Invest. No. 87-11-033, Decision 94-09-065 at 204–24 (Sept. 15, 1994).

15. Clear Communications, Ltd. *v.* Telecom Corp. of New Zealand, Ltd., slip op. (H.C. Dec. 22, 1992), *rev'd*, slip op. (C.A. Dec. 28, 1993). For discussions of the case, see James Farmer, *Transition from Protected Monopoly to Competition: The New Zealand Experiment*, 1 COMPETITION & CONSUMER L.J. 1 (1993); Baumol & Sidak, *The Pricing of Inputs Sold to Competitors, supra* note 4, at 189–94; Kahn & Taylor, *supra* note 6, at 229 n.10. The rule was rejected because the Court of Appeal held that under New Zealand law no agency has the power to prevent inclusion of monopoly profit in the opportunity cost component of the input price, a conclusion subsequently rejected by the Judicial Committee of the Privy Council.

16. Telecom Corp. of New Zealand Ltd. *v.* Clear Communications Ltd., [1995] 1 N.Z.L.R. 385, 404–05 (Oct. 19, 1994, Judgment of the Lords of the Judicial Committee of the Privy Council) (citing Baumol & Sidak, *The Pricing of Inputs Sold to Competitors, supra* note 4; Kahn & Taylor, *supra* note 6).

17. ROBERT J. GRANIERE, ALMOST SECOND-BEST PRICING FOR REGULATED MARKETS AFFECTED BY COMPETITION (National Regulatory Research Institute Paper No. NRRI 96-10, Mar. 1996).

> We generally agree with Time Warner that the value of leased access channels "is the opportunity cost imposed on the operator from the lost chance to program these channels."[18]

The Commission defined opportunity cost in this situation as follows:

> The portion of the maximum rate for leased access channels included in a tier of programming which we propose be paid by the leased access programmer . . . would be based on the reasonable costs (including reasonable profits) that leased access imposes on the operator. These costs are specific to the channels designated for leased access. Some of these costs are associated with removing or "bumping" non-leased access programming to accommodate leased access programming; others are the direct costs associated with the specific leased access programmer or its programming. To simplify this discussion, we will refer to all of these costs as opportunity costs.[19]

The Commission further concluded that "any profit which is generated from subscriber revenue could be viewed as an opportunity cost imposed on the operator who forgoes these profits when this channel is used to carry leased access programming."[20] The Commission does not explain why it proposes in its interconnection docket to prohibit the states' use of the same pricing rule for mandatory access that the agency embraced only three weeks earlier and that numerous other regulatory bodies have endorsed as conducive to economic welfare.

C. *Responses to the Criticisms of the ECPR*

Despite the distinguished group of economists who have endorsed the ECPR in its original or refined form, and despite the Commission's own use of the ECPR by another name in its establishment of rules for the pricing of leased access to cable channels, the agency in this docket in effects makes the empirical claim that the costs of the ECPR are numerous and that they outweigh the rule's benefits. We consider now the standard criticisms of the ECPR, some of which the Commission does not raise, but all of which can be immediately answered.

1. *"The ECPR Impedes Dynamic Efficiency"*

The Commission asserts: "In general, the ECPR framework precludes the opportunity to obtain the advantages of a dynamically competitive marketplace."[21] That adverse result supposedly obtains because, according to the Commission, the incumbent LEC makes the same profits whether it provides the entire service or sells network access to entrants. In the Commission's view, that condition of indifference gives the incumbent LEC no incentive to reduce costs by introducing new technology or to provide better services. That reasoning, however, finds no support in either theory or empirical experience.

Like the argument that the ECPR preserves monopoly rent, the argument that the rule impedes dynamic efficiency depends on a counterfactual empirical assumption: Regulators are either indifferent to the incumbent LEC's total factor productivity or ineffectual in creating incentives for productivity growth. Such an assumption ignores the prevalence of price caps, rate freezes, and other incentive regulation schemes that reward greater

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18. Implementation of Sections of the Cable Television Consumer Protection and Competition Act of 1992: Rate Regulation Leased Commercial Access, Order on Reconsideration of the First Report and Order and Further Notice of Proposed Rulemaking, MM Dkt. No. 92-266, CS Dkt. No. 96-60, 1996 FCC LEXIS 1544 ¶ 61 (released Mar. 29, 1996) (quoting Time Warner comments) [hereinafter *Leased Access Order on Reconsideration*].

19. *Id.* ¶ 69. "[T]he operator would be allowed to recover only those types of opportunity costs which can reasonably be attributed to carriage of the leased access programming and which are reasonably quantifiable." *Id.*

20. *Id.* ¶ 78.

21. *NPRM* ¶ 147.

efficiency.[22] Nothing prevents regulators from building incentive mechanisms of that sort into their regulation of the pricing of mandatory network access under the ECPR.

Furthermore, the Commission's claim of lost dynamic efficiency under the ECPR is empirically controverted by the actual experience in New Zealand, the first nation to embrace the rule in local telephony. By any measure, Telecom New Zealand's investment and productivity gains have been substantial, and the country's telecommunications network is one of the most advanced in the world. From the beginning of deregulation in 1987 through the end of 1994, Telecom New Zealand invested over NZ$4.1 billion in network modernization and service enhancement.[23] Now, more than 97 percent of access lines are connected to digital switches; by 1998, Telecom New Zealand's telephone network will be entirely digitally switched.[24] In addition to this investment in infrastructure, there has been an "introduction of a growing range of new services such as call diversion, audio conference and call waiting."[25] To be sure, it would be an overstatement to attribute all of New Zealand's gains in efficiency to its adoption of the ECPR. Nonetheless, that empirical evidence at a minimum shifts the burden of proof back onto the Commission to substantiate its sweeping assertion that the states' use of the ECPR would entail a sacrifice in dynamic efficiency.

2. *"The ECPR Requires Difficult Measurement of Future Earnings Forgone"*

The Commission argues that accurate measurement of the incumbent LEC's loss of revenue would make the ECPR difficult to employ: "[A]s an administrative matter, it would be difficult for a regulatory agency to determine a carrier's actual opportunity cost."[26] That criticism is doubly unpersuasive. First, it fails to explain why the estimation of forgone net revenue would be any harder than the typical test-year calculations that are routinely conducted in rate proceedings, or the estimates of productivity growth that are made to compute the "*X* factor" in price-cap regulation.

Second, the Commission's complaint is inconsistent with its own detailed discussion of how to compute opportunity cost when determining the mandatory price of leased access to cable channels.[27] In its March 29, 1996 order, the Commission devoted eleven paragraphs consisting of more than 2,000 words to a discussion of how to compute "net opportunity costs" for purposes of pricing leased access. In contrast, the Commission devotes only one sentence to the analogous issue concerning mandatory access to the local exchange network and gives no indication of why, only three weeks after its pronouncements on leased access, state and federal regulators should find the definition and measurement of opportunity costs to be an insuperable challenge.

Moreover, *any* method for computing prices for network access will entail some nontrivial amount of administrative costs. The relevant objective, which the Commission seems not to recognize, is not to minimize the regulator's administrative costs, but rather to maximize the gains in economic welfare from the access pricing rule chosen, net of such administrative costs.[28] If a particular access pricing rule stifles efficient entry or

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22. *See generally* DAVID E.M. SAPPINGTON & DENNIS L. WEISMAN, DESIGNING INCENTIVE REGULATION FOR THE TELECOMMUNICATIONS INDUSTRY (MIT Press & AEI Press 1996).

23. NEW ZEALAND MINISTRY OF COMMERCE, TELECOMMUNICATIONS REFORM IN NEW ZEALAND: 1987–1994, TELECOMMUNICATIONS LEAFLET NO. 5, at 4 (Jan. 19, 1995).

24. *Id.*

25. *Id.*

26. *NPRM* ¶ 147.

27. *Leased Access Order on Reconsideration* ¶¶ 79–89.

28. This principle is simply a variant on the argument, familiar in antitrust policy, that a liability rule should minimize the combined costs of false positives (type I errors), false negatives (type II errors), and the costs of administration. *See* Paul L. Joskow & Alvin K. Klevorick, *A Framework for Analyzing Predatory Pricing Policy*, 89 YALE L.J. 213, 223 (1979); *see also* Frank H. Easterbrook, *Predatory Strategies and Counterstrategies*, 48 U. CHI. L. REV. 263, 318–19 (1981); Richard C. Schmalensee, *On the Use of Economic Models in Antitrust: The* ReaLemon *Case*, 127 U. PA. L. REV. 994, 1018–19 n.98 (1979). For extensions to telecommunications regulation, see BAUMOL & SIDAK, TOWARD COMPETITION IN LOCAL TELEPHONY, *supra* note 4, at 131–32; MACAVOY, *supra* note 7, ch. 6; Kenneth J. Arrow, Dennis W. Carlton & Hal S. Sider, *The Competitive Effects of Line-of-business Restrictions in Telecommunications*, 16 MANAGERIAL & DECISION ECON. 301, 305 (1995) ("The goal of public policy in telecommunications should not be simply to minimize potential regulatory problems but instead to maximize net benefits to society."); J. Gregory Sidak, *Telecommunications in Jericho*, 81 CAL. L. REV.

bankrupts efficient incumbents, it is hardly an endorsement for that rule that it requires few of the regulator's resources to administer.

3. *"The ECPR Preserves Monopoly Rent"*

The Commission argues that the ECPR will protect monopoly profits if they are being earned by the incumbent LEC and that the rule does not ensure lower prices and higher outputs in a competitive market:

> Under the ECPR, competitive entry will not place at greater risk the incumbent's recovery of its overhead costs or any profits that it otherwise would forego due to the entry of the competitor. In other words, the incumbent's profitability would not be diminished by providing interconnection or unbundled elements or both . . . . The ECPR presupposes that the incumbent is the sole provider of a bottleneck service, and seeks to define efficient incentives for incremental entry based on that assumption. Under the ECPR, competitive entry does not drive prices toward competitive levels, because it permits the incumbent carrier to recover its full opportunity costs, including any monopoly profits.[29]

For four reasons, the Commission's claim that the ECPR preserves monopoly rents is erroneous or misdirected.

a. *The ECPR with Facilities-Based Competition for Access*

The first flaw in the Commission's claim that the ECPR preserves monopoly rents is that it misapprehends how the rule functions when there is facilities-based competition for the provision of network access. If facilities-based competition is infeasible, then the basis for the opportunity-cost calculation in the ECPR is the incumbent LEC's regulated margins. But if access competition is feasible, then the ECPR methodology requires pricing at the incremental cost of the best alternative technology for providing network access, even if that lower price of access fails to preserve the incumbent LEC's regulated margin. Thus, contrary to the Commission's claim, the ECPR cannot protect the incumbent LEC's regulated margins from the downward pressure of access competition. Market forces simply will not permit the incumbent LEC to charge a higher price than the incremental cost of the best alternative technology for provision of network access, even if the incumbent LEC may lawfully attempt in vain to do so.

The existence of access competition also establishes that the facilities of the incumbent LEC are not "essential," as that term has come to be known in antitrust law.[30] Entry barriers to facilities-based competition are not insurmountable, as evidenced by the substantial investment in transmission and switching facilities that has already occurred in the local exchange.[31] In addition, technological change has lowered the entrant's need to make irreversible, transaction-specific investment: Wireless technologies lower the specificity of entry costs in comparison with traditional wired technologies. Consequently, there is less reason with each passing day to presume that the wireline facilities of the incumbent LEC, if unregulated by the states, still could generate the monopoly rents that evidently motivate the Commission's opposition to the states' use of the ECPR.

1209, 1216–17 (1993).

29. *NPRM* ¶ 147. Similarly, the Commission said in its NPRM on CMRS interconnection: "[B]ecause the ECPR would permit an incumbent carrier to recover its opportunity costs, including any monopoly profits in the sale of the final service, the use of this rule may prevent competitive entry from driving prices towards competitive levels." *CMRS NPRM* ¶ 53.

30. United States *v.* Terminal R.R. Ass'n, 224 U.S. 383 (1912); MCI Comm. Corp. *v.* American Tel. & Tel. Co., 708 F.2d 1081 (7th Cir.), *cert. denied*, 464 U.S. 891 (1983).

31. Daniel F. Spulber, *Deregulating Telecommunications*, 15 YALE J. ON REG. 25 (1995).

b. *The Unrealistic Counterfactual of Unregulated Monopoly Free of Mandated Cross Subsidies*

The second flaw in the Commission's claim that the ECPR preserves monopoly rent is that the agency criticizes the rule on the basis of imagined circumstances that do not exist in the real world. To assume that a regulated monopolist is routinely and consistently earning monopoly rents is empirically counterfactual: The *raison d'etre* of public utility regulation is to prevent a firm thought to be a natural monopoly from setting the profit-maximizing price of an unconstrained monopolist. Contrary to the Commission's implicit assumption, state regulation in place before the enactment of the 1996 federal legislation should be presumed to have limited rather than facilitated the extraction of monopoly rents. If state regulation failed to prevent incumbent LECs from earning monopoly rents, then state regulators should now correct their past failures directly. But even if it a state did permit an incumbent LEC to earn monopoly rents, the need to reform that state's regulation would not justify the FCC's rejection of the ECPR in favor of some other pricing method that will fail to yield efficient and compensatory pricing of mandatory network access.

Moreover, if monopoly rents do persist in the pricing of some final product sold by the regulated incumbent LEC, it is likely that regulators have authorized or mandated the extraction of those rents as part of an overall rate structure that is rife with cross subsidies from one customer group to another. It is certainly possible, in other words, that the prices for specific services sold by the regulated incumbent LEC contain rents that the firm is obliged to extract from one set of customers and then dissipate in the course of subsidizing other services that the regulator orders the LEC to sell below cost. In that case, the recovery of the contributions to margin on the services supposedly generating the monopoly rents represents nothing more than a preservation of state-mandated cross subsidies; those positive contributions to margin should not be interpreted by the FCC in isolation as a preservation of monopoly rents that, on balance, flow from the combined classes of all customers to the incumbent LEC's shareholders. In any event, it is surely preferable for the regulator to eliminate the system of cross subsidies altogether by rebalancing the rate structure, rather than to reject the ECPR and instead price network access selectively on the basis of incremental cost while continuing to require the incumbent LEC to price various other services below cost. Such a selective approach would violate sound economic analysis and deny the incumbent LEC the opportunity to recover its costs, which eventually would destroy the LEC's financial solvency.

c. *The ECPR with Falling Prices*

The Commission's claim that the ECPR preserves monopoly rents is that it fails to account for recent academic research demonstrating otherwise. Contrary to the FCC's claim, the ECPR can support both efficient entry *and* falling prices for the end product. In a February 1996 Kellogg School of Management working paper, *Access Pricing and Deregulation*, Spulber and Sidak show that several common criticisms of the efficient component-pricing rule are misplaced.[32] First, the access price derived from the ECPR permits price to fall and output to expand for the final product relative to the price and output that had obtained under regulation. Second, that result holds under a variety of market structures: In contestable markets, under Cournot-Nash competition, and in markets characterized by product differentiation, the ECPR rewards entry by more efficient rivals and produces lower prices for the final product. Finally, the equilibrium access price implied by the ECPR for each of those market structures is lower than the access price that would obtain in the stylized benchmark case in which the incumbent LEC is permitted (contrary to actual experience in regulated markets) to receive the entire monopoly rent in the opportunity-cost component of the ECPR.

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32. Daniel F. Spulber & J. Gregory Sidak, *Access Pricing and Deregulation* (Kellogg School of Management working paper, Feb. 1996).

d. *Misdirected Criticism of Policy Instruments*

The fourth fallacy in the Commission's claim that the ECPR perpetuates monopoly rents is that the agency attempts to redress a perceived failure of public utility regulation by manipulating the wrong policy instrument. Even if state regulators were to permit an incumbent LEC to earn monopoly rents (net of all government-mandated cross subsidies), that fact would not undermine the economic efficiency *of the ECPR*. The rule's purpose is to reward efficient entry into the market for the end product by ensuring that the incumbent LEC sells network access to itself and to its rivals on the same, nondiscriminatory terms. The ECPR accomplishes that task regardless of the market structure and regardless of the presence or absence of economic rents.

The Judicial Committee of the Privy Council of the House of Lords recognized the efficacy of the ECPR when, in *Telecom Corporation of New Zealand Ltd.* v. *Clear Communications Ltd.*, that court of last resort considered whether the ECPR would violate section 36 of New Zealand's Commerce Act by allowing Telecom to recover monopoly rents in the opportunity-cost component of the access price that it proposed to charge to the entering local carrier, Clear, for interconnection to Telecom's access network.[33] Their Lordships emphasized that courts applying section 36 "are not acting as regulators" and that "section 36 is only one of the remedies provided by the Commerce Act for the purpose of combatting over-pricing due to monopolistic behavior."[34] Other sections of the Commerce Act, Lord Browne-Wilkinson observed, are available to perform that role:

> Part IV [of the Commerce Act] deals separately with control of prices. Under section 53 the Governor-General, on the recommendation of the Minister, may declare that the prices for goods or services of any description supplied to or for the use of different persons are controlled. Under section 53(2)(a) a Minister cannot make such a recommendation unless he is satisfied the goods or services are supplied in a market "in which competition is limited or is likely to be lessened." Under section 70 the Commission may authorize a price to be charged for controlled services. Therefore section 36 is only part of an overall statutory machinery for dealing with trade practices which operate to the detriment of consumers. Another part of such machinery (Part IV) is specifically directed to the regulation of prices in markets which are not fully competitive.[35]

The Privy Council ruled that "the risk of monopoly rents has no bearing upon the question whether the application of the [efficient component-pricing rule] prevents competition in the contested area."[36] "If *both* Telecom and Clear are charging their customers the same amount in the area in which they are not competitors," their Lordships reasoned, "this does not have any effect on their relative competitiveness in the area in which they compete."[37]

4. *"The ECPR Limits Competitive Entry"*

As the Privy Council's analysis in *Telecom* v. *Clear* makes clear, the ECPR does not limit competitive entry in the case of interconnection of local networks to effect terminating access. Likewise, when entry occurs instead by means of resale or unbundled access to network elements, access prices that recover the incumbent LEC's long run incremental costs and its opportunity costs are no barrier to the entry of competitors that are at least as efficient as the incumbent in the provision of retail services. In all three cases prices that are computed according to the ECPR are both efficient and compensatory. By setting access prices that allow the incumbent LEC to

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33. [1995] 1 N.Z.L.R. 385 (Judgment of the Lords of the Judicial Committee of the Privy Council, Oct. 19, 1994); *see also* Baumol & Sidak, *The Pricing of Inputs Sold to Competitors: Rejoinder and Epilogue*, *supra* note 4 (discussing New Zealand interconnection litigation).

34. [1995] 1 N.Z.L.R. at 404.

35. *Id.*

36. *Id.* at 407.

37. *Id.* (emphasis in original).

recover its costs, retail rates will fall to reflect (1) the efficiencies of resellers and of aggregators of unbundled elements, (2) the increased demand at the lower prices, and (3) the lowering of the cost recovery per unit.[38]

Consider now how competition in the provision of network access affects the ECPR and the incentives that it creates for efficient entry. With facilities-based competition, it is evident that the ECPR does not impede entry. Setting the ECPR at the incremental cost of the best alternative technology allows the entry of other companies that are at least as efficient as that entrant serving as the benchmark. The facilities-based entrant serving as the benchmark, however, can be less efficient than the incumbent LEC because the ECPR price does not undercut that entrant's incremental cost.

5. *"The ECPR Recreates Cost-of-Service Regulation"*

The ECPR is a method of pricing access that a regulator uses to unbundle an incumbent LEC's network. The rule is intended to produce efficient access and entry decisions and to compensate the incumbent LEC for the incremental cost and the opportunity cost of being compelled to allow a competitor to use the LEC's network. If, because of access competition, even the ECPR cannot produce an access price for the incumbent LEC's network that is compensatory, then the regulator must take an additional step to ensure that the LEC can achieve full recovery of the cost of providing mandatory network access to its competitors. The regulator can do so by imposing an end-user charge equivalent to the amount of the shortfall remaining after computation of the access price implied by the ECPR.

From this brief recapitulation, it should be clear that the ECPR does not recreate cost-of-service regulation. To the extent that regulated retail rates remain in force, the ECPR provides a means to translate those rates into access charges for wholesale services and unbundled network elements. The continuation of regulated retail rates is a regulatory decision that is independent of the regulator's application of the ECPR to calculate wholesale rates.

To be sure, the calculation of wholesale rates does depends on the incremental cost and the opportunity cost borne by the regulated incumbent LEC. In the absence of regulation, the incumbent LEC would determine its own access charges in a similar manner. The regulation of wholesale rates necessarily creates the need for the incumbent LEC to present cost information to the regulator as part of the process of administering the ECPR—or, for that matter, any other rule for access pricing. The relaxation of cost-of-service regulation, on the other hand, would allow the incumbent LEC to set its access charges without presenting cost information to its regulator.

With facilities-based entry, the ECPR bases rates on the cost of the best alternative technology for the provision of network access. That computation requires an estimation of the *competitor's* incremental cost. Such an exercise differs substantially from regulation based on the costs of the firm being regulated—namely, the incumbent LEC. Consequently, when firms compete to provide network access, the regulator's application of the ECPR fundamentally departs from traditional cost-of-service regulation.

6. *"The ECPR Is Fully Distributed Cost Pricing"*

The ECPR is not a form of fully distributed cost (FDC) pricing. To be sure, the ECPR is based on costs because it prices any network component at the sum of its incremental cost and plus opportunity cost as constrained by the market. That exercise, however, need not entail the use of an arbitrary FDC allocation of joint and common costs. If the regulator preserves a structure of regulated rates, then any underlying cost allocation will be reflected in the calculation of wholesale rates by subtracting avoided incremental costs from retail rates. Any problems with the outcome in that case result not from the ECPR, but from the regulator's failure to rebalance regulated rates.

With resale competition and flexible prices the ECPR adjusts downward to reflect falling retail prices. That adjustment does not imply any reliance upon FDC cost methodology. Similarly, if there is facilities-based

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38. For a technical economic analysis demonstrating these assertions, see Spulber & Sidak, *Access Pricing and Deregulation, supra* note 32.

competition, no FDC methodology motivates the result under the ECPR that the incumbent LEC should price access at the incremental cost of the best alternative technology for the provision of network access.

D. *Conclusion*

The Commission's abbreviated discussion of the empirical effects of adopting the efficient component-pricing rule in the NPRM in CC Dkt. No. 96-98 does not do the concept justice. The ECPR is neither flawed nor impractical, as the Commission implies. Nor has the rule withered under the glare of academic scrutiny. To the contrary, it has blossomed. A rapidly growing body of economic analysis confirms the robust efficiency characteristics of the ECPR. That analysis makes clear that the ECPR not only is socially beneficial, but also is practical enough for the Commission and the state public utilities commissions to employ without undue administrative burden.